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REMARKS

The undersigned wishes to thank Examiner Daniels for his time and attention to the issues relating to this application in their meeting at the Patent Office on June 25, 2007.

Disposition of Claims

Upon entry of the foregoing amendments, claims 1-3 and 6-7 will remain pending in the application. Claims 4-5; 8-14; and 15-22 were canceled in previously filed amendments. In the current amendment, claim 1 has been amended to clarify two important points: 1) the wax-like, polymerizable material is dimensionally stable in its uncured state at ambient temperature; and 2) the material comprises a mixture of monomer, oligomer, and light sensitizer. Briefly, in review, the method of the present invention is directed to making dental devices such as dentures. The method involves shaping a first wax-like polymerizable material to form a first portion of the device. This material is specially formulated -- it can be molded and configured to a desired geometric shape easily. The material is prepared from a mixture of oligomer *(Preparation 1 at paragraph 0009)*; monomer *(Preparation 2 at paragraph 0011)*; and light sensitizer *(Preparations 4-6 at paragraphs 0013-0015)*. Different light sensitizers are described at Paragraph 0003. The material can be used to prepare high strength dental products which are defined at Paragraph 0006. More particularly, the mixture of monomer, oligomer and light sensitizer as well as other ingredients in the composition and the resulting physical properties are given in Tables 1 and 2.

The resulting shaped material maintains its structure and geometric dimensions while resting in an uncured state at ambient temperature. Next, a second wax-like polymerizable material, having the same properties as the first material, is shaped to form a second portion of the device. After the shape-stable first and second materials have been shaped and contoured, they are cured via light radiation to form a high strength dental device. The shape-stable and high-strength properties of the materials are discussed throughout the Specification.

Rejections under 35 U.S.C. §103(a)

The outstanding Office Action rejects claims 1-3 and 6-7 under 35 U.S.C. § 103(a) as being unpatentable over Deguchi, U.S. Patent 6,136,886 ("Deguchi") in view of Völkel et al., U.S. Patent 6,057,383 ("Völkel") and further in view of Angeletakis, U.S. Patent 6,121,344 ("Angeletakis") and Saracsan, U.S. Patent 4,452,964 ("Saracsan"). In response, Applicants respectfully submit that combining the disclosures in Deguchi, Völkel; Angeletakis; and Saracsan does not render the presently claimed invention, as recited in amended claims 1-3 and 6-7, prima facie obvious for the reasons discussed below.

Deguchi generally teaches a method of making a dental prosthetic material by shaping first and second polymerizable materials. In Deguchi, the method involves molding a first colored resin to produce the enamel portion of an artificial tooth followed by molding a second colored resin for producing the dentin portion. The different tooth portions are completely polymerized in a final molding step (col. 2, lines 1-23). Deguchi, however, does not disclose polymerizable wax-like dental materials.

Völkel discloses wax-like polymerizable substances that can be molded and shaped in the mouth. The materials can be photopolymerized and used to make temporary and permanent dental prostheses, crowns, bridges, and inlays. However, these materials are not high strength dental polymeric materials as recited in amended claim 1 and defined in the subject application. Applicants' materials are required to have a flexural modulus of at least 250,000 psi and flexural strength of at least 5,000 psi as noted at page 2 (paragraph 3) of the Specification. By contrast, test results show that materials described in the Völkel patent only have a flexural modulus of 207,900 psi and flexural strength of 2,897 psi as discussed in a Rule 132 Declaration previously filed by Applicants. In the office action dated November 9, 2006, the Rule 132 Declaration was acknowledged as being sufficient to overcome the previously made rejections of the claims based on the Deguchi and Völkel references.

Secondly, the material of this invention comprises a mixture of monomer, oligomer, and light sensitizer as discussed above; Völkel does not describe such a composition -- rather the wax-like monomer is combined with other monomers:

> By combining the wax-like polymerizable substances according to the invention with other monomers preferably having a crosslinking effect, dental materials can be produced which after polymerization approach the E modulus of conventional polymethyl methacrylate (PMMA) materials. (Col. 5, lines 5-14).

The wax-like, polymerizable material of the present invention is clearly different than the materials described in Völkel.

Angeletakis discloses dental composite materials containing resins and ground filler particles having an average particle size of about 0.05 μm to about 0.50 μm and microfiller particles having an average particle size of 0.04 μm or less. In Table 3 (col. 10), the Angeletakis materials are described as having a flexural modulus in the range of 1,341,309 to 1,589,613 psi and a flexural strength in the range of 16,099 to 19,725 psi. Angeletakis, however, does not disclose polymerizable wax-like dental materials. Secondly, the strength of the Angeletakis materials is due to the structural fillers dispersed therein. As opposed to Angeletakis, the strength of Applicants' material is not due to reinforcing particulate material or any other strengthening agents. Instead, the polymerizable resin matrix, by and in itself, provides Applicants' material with its high strength.

Saracsan discloses urethane acrylate compositions that can be used for molding articles such as automobile parts and meat boxes. The compositions are polymerized via special reaction conditions including condensation and free radical reactions. Peroxide compounds are added to the reaction mixture so that it self-cures. Many urethane acrylate sample compositions were prepared according to Saracsan and the compositions had a wide range of properties. It is reported that one sample exhibited a flex modulus of 394,000 psi (col. 2, lines 62-68). However, there is no suggestion these compositions consistently demonstrate high strength properties. Only one sample is reported as having a flex modulus of greater than 250,000 psi - it is possible that many other samples prepared according to the methods in Saracsan do not have high flex modulus. In addition, conventional urethane acrylate compositions, as disclosed in Saracsan, do not have wax-like properties. This is supported by Comparative Example 9 (Table 4) in Völkel which describes compositions containing blends of polycaprolactone and aliphatic urethane diacrylate resins as being thermoplastic materials that display rubber-like viscosity but are not wax-like. Turning back to Saracsan, the acrylated urethane material is described as being a viscous liquid at room temperature that can be poured into glass jars (col. 4, lines 38- 40). It is not a material which is dimensionally stable in its uncured state at ambient temperature.

In view of the foregoing, it is submitted that the presently claimed invention would not be obvious based on the teachings in Deguchi, Völkel; Angeletakis; and Saracsan taken alone or in combination. Accordingly, it is respectfully requested that the rejection of claims 1-3 and 6-7 under 35 U.S.C. § 103(a) be withdrawn.

Conclusion

In summary, Applicants submit that claims 1-3 and 6-7 (as amended) are patentable and each of the Examiner's rejections and objections has been overcome. Accordingly, Applicants respectfully request favorable consideration and allowance of amended claims 1-3 and 6-7.

The Commissioner is hereby authorized to charge any additional fee required in connection with the filing of this paper or credit any overpayment to Deposit Account No. 04-0780. Should there be any outstanding matter that needs to be resolved in the present application; the Examiner is invited to contact the undersigned at the telephone number provided below.

Respectfully submitted,
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